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AUTHOR	Cahen, Leonard S.
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ABSTRACT

The selection of second and fifth grade students for the Beginning Teacher Evaluation Study (BTES) is described. The BTES investigates teacher behaviors which relate to student achievement in reading and mathematics. From a group of teachers, schools, and districts volunteering to participate, 46 schools in 14 school districts were selected. The Selection Battery of achievement tests (reading and mathematics tests for each grade level) was administered in these 40 second grade and 41 fifth grade classrooms, in order to select the target students for the investigation. High and low cutting scores defining average levels of student test performance were tentatively established. The lower limit was, in some cases, lowered slightly in order to meet the selection criteria. In no instances was the upper limit raised. The selection objectives were to gain equal male and female representation in each class, and to obtain at least 30 classes at each grade level having at least six students within the specified range of cutting scores. The classroom teachers helped to remove certain students from the list of eligible targets: those who would be moving out of the district, and those who were repeating that grade level. Brief descriptions of the tests and the resulting data are presented. (GDC)

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BTES

BEGINNING TEACHER EVALUATION STUDY

Technical Note Series

TECHNICAL NOTE III-1
(Part II)

Selection of Second and Fifth Grade Target Students for Phase III-B

Leonard S. Cahen

January 7, 1977

TM006 880

FAR WEST LABORATORY
FOR EDUCATIONAL RESEARCH AND DEVELOPMENT
1855 FOLSOM STREET • SAN FRANCISCO CALIFORNIA 94103 • (415) 565 3000

TECHNICAL NOTE III-1

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Selection of Second and Fifth Grade Target Students for Phase III-B

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INTRODUCTION

The first part of Technical Note III-1 (Cahen, 1976) presented issues and described the development of a Selection Battery used to identify target students for Phase III-B of the Beginning Teacher Evaluation Study (BTES). A discussion of issues related to the selection of target students for Phase III-B was also presented in that document.

In this report, the second part of Technical Note III-1, the actual selection of second and fifth grade target students for Phase III-B of the Beginning Teacher Evaluation Study is described.

Sample Selection

A list of districts, schools and teachers who had volunteered for the BTES study was assembled by the staff of the California Commission for Teacher Preparation and Licensing (CCTPL) in the spring of 1976 and delivered to the BTES staff of the Far West Laboratory. Based on data about socioeconomic status (SES) furnished by the CCTPL, schools which had comparatively high levels of SES, relative to the total volunteer group, were deleted from further consideration by the Laboratory. One district was deleted because SES data could not be obtained. Six additional deletions were made in order to limit to two the number of potential second grade volunteer teachers per school. From the original group of 123 teacher volunteers, provided by the CCTPL, 93 teachers were scheduled for initial contact in the fall of 1976. During this preliminary stage of telephone contact and interviews with the 93 teachers there was the expected attrition of volunteers for a variety of reasons. Therefore, a vigorous recruitment drive was conducted simultaneously with the initial school visits to insure that a minimum of 40 classrooms per grade could be obtained for the screening sample. The final selection sample included 40 second grade and 41 fifth grade classrooms. Forty-six schools in 14 school districts were involved.

All districts that participated in the "selection" phase of the study were within 60 miles of San Francisco. Tables 1 and 2 show the designated grade level and the number of students actually tested in these classrooms.

Insert Tables 1 and 2 Here

It should be noted that some of the classrooms were "grade mixed," i.e., some of the classrooms had students who were not second or fifth graders. Table 3 summarizes the data shown in Tables 1 and 2.

Insert Table 3 Here

The Selection tests were administered by the BTES field staff. All test administrators had previously completed training sessions. These sessions helped the test administrators to gain familiarity with the general directions, the nature of the tests, the time requirements, etc. Selection testing took place between September 20, 1976 and October 1, 1976. The tests, which are described in Technical Note III-1, were given to all students in the volunteer classes. All subtests in the Battery were administered as separately timed sections.

Students at both grade levels worked and recorded their responses in the test booklet. After testing was completed the test administrators brought the test booklets back to the Far West Laboratory where processing took place. Test responses were coded and keypunched. After approximately half the data were keypunched, the students test responses were analyzed by means of an item analysis computer routine. The preliminary output of this analysis was examined. This allowed Laboratory personnel to make a final check on our computer routines, scoring procedures, and keys.

When the remaining booklets were returned to the Laboratory for processing, we moved ahead to scoring all tests, creating total reading and mathematics scores for all students tested. In addition we generated frequency distributions

and summary data for the population of students tested at both grade levels.

Following a staff review of tests score frequencies for the total group of students, and incorporating the suggested cut-points outlined in Technical Note III-1, a tentative selection of high and low cut-points was made for both the reading and mathematics tests at each grade level. Students were listed by identification number within each class along with their mathematics and reading scores and the code for sex. The lists were reviewed by staff. The criteria for selection were: (1) to gain approximately equal male and female representation within class, and (2) to obtain at least 30 classes at each grade level with at least six students within the bands established by high and low cut-points on the mathematics and reading Selection Batteries. Additional computer runs were made with different cut-points until the dual criteria were met. When we were confronted with problems of obtaining the necessary number of students per class, we followed our basic policy of lowering, slightly, the lower limits of the band. We did not raise the upper limits of the band because we wanted to avoid ceiling effects at later testing.

Table 4 shows the low and high score defining bands for the Mathematics Selection Battery and Reading Selection Battery in grades 2 and 5. The points in parentheses in Table 4 show the suggested or original bands developed in the modeling procedure and reported in Technical Note III-1. A look at Table 4 shows that we never exceeded the suggested upper band, but we did lower, in most cases, the limits of the lower band. The lower bands were reduced more for reading than mathematics at both grades. To further illustrate the data in Table 4: for second grade mathematics a student had to have a score of 5 or more, but not higher than 19 to be in the defined band. At second grade we were looking for students who would be in this band in mathematics on the Mathematics Selection Battery and would have a score of no less than 5.5 and no more than 22 on the Reading Selection Battery.

Insert Table 4 Here

Summary lists of students were prepared, arranged by class and sex code. Within sex, the students were listed in order from high score to low score in mathematics. A sample printout showing a fictitious listing of grade 2 students is shown in Table 5.

Insert Table 5 Here

An examination of Table 5 reveals that Debbie Smith would be in the band for Mathematics and Reading and therefore would be eligible to be selected as a target student. Patricia O'Neal would be in the eligible band for Mathematics but scored too high on Reading to be in the band and therefore, would not be eligible to be selected as a target student.

Within sex, students who met the eligibility criteria of having scores within bands were sequentially numbered. If there were more than six eligible target students, a sample of students was drawn using a table of permuations (Moses and Oakford, 1973). A list of "selected" target students and alternates were then finalized and the identification numbers of the "selected" target students were entered into the computer and lists were prepared showing the names of only the selected teachers and students. These final lists were used to contact teachers, and were shown to the selected teachers at meetings at the Laboratory. The teachers reviewed their lists of selected students and in some cases, suggested certain students be dropped. The suggestions were based on the teachers' knowledge that certain students would be moving from the district, certain students were "repeaters," (they were in the second or fifth grade the previous year), etc. We cannot overemphasize the importance of the information we received from the teachers in the selection of "target students."

Psychometric Properties of the Selection Tests

The last section of this document will report the psychometric properties of the Selection Batteries and provide descriptive information about the selected target students. All second grade analyses, psychometric and descriptive, are reported on the 873 second graders tested with the Selection Battery. The fifth grade data is based on all fifth graders tested plus six sixth graders and one fourth grader who were selected as target students. The fifth grade data includes 912 students.

Second Grade Selection Battery. Sight words (14 items) and decoding vowels (10 items) were of medium difficulty. The comprehension with pictures subscale (11 items) was slightly more difficult. This 35-item total test had a mean of 18.7 and standard deviation of 10.4. The second grade Mathematics Selection Battery was a much more difficult test. The 47-item test had a mean of 12.32 with a standard deviation of 9.83.

Fifth Grade Selection Battery. For fifth grade Reading, the comprehension subtest (10 items) was slightly more difficult than the 21-item short and long vowel subtest and the 12-item context clues subtest. The mean for the 43-item total test was 24.7 with a standard deviation of 11.2. The subtraction scale (10 items) and the addition and subtraction of decimals (10 items) scale were at medium difficulty but the cross-reference computation test (14 items) was observed to be much more difficult. The 34-item total test yielded a mean of 14.7 and standard deviation of 9.7.

Estimated and Actual Data. Table 6 shows the reliability coefficient and standard error of measurement for the reading and mathematics Selection Batteries for grades 2 and 5. The reader should note the similarity between the coefficients obtained for the students tested in Phase III-B and the coefficients estimated

from the statistical "models" developed and reported in Technical Note III-1. For example, the standard error of measurement estimated from modeling done with Phase III-A data, for second grade reading, was 2.82. The estimated standard error of measurement for the data administered on the Selection Battery, for Phase III-B students, was 3.06. The actual psychometric properties of the tests administered in Phase III-B and the estimates based on the modeling procedures recorded in Technical Note III-1, are very comparable.

Insert Table 6 Here

Second Grade Target Students. A total of 150 target students were selected from the second grade population. Seventy-one boys and 79 girls were selected. Three hundred and fifty-seven boys were not selected and 366 girls were not selected. Tables 7 and 8 show the descriptive test characteristics for boys and girls on reading and mathematics.

Insert Tables 7 and 8 Here

Table 8 is a condensation of data from Table 7, where sex is not displayed as a characteristic. An examination of Table 8 shows that the standard deviation of the Mathematics Selection Tests is reduced from 10.6 for the non-selected students to 4.2 for the selected or target students. For reading, the standard deviation is reduced from 11.1 to 5.6. The variability for the target students was dramatically reduced as compared to the non-selected by removing students outside the selection bands.

Fifth Grade Target Students. Tables 9 and 10 show the data for selected and non-selected students at grade 5. For the Mathematics Selection Battery the standard deviation is reduced from 10.4 to 4.3. For the Reading Selection Battery the standard deviation was reduced from 11.8 to 6.8. An examination of Table 10

indicates that the mean for the target students, for both mathematics and reading, were higher for the target students than for the non-selected students. This information, in combination with the information about the reduction of variance, indicates that the lower scoring students were removed from eligibility as target students at fifth grade.

Insert Tables 9 and 10 Here

Summary

Since there was wide variability across classes it is possible that a target student selected from one class could be at the bottom of his/her class, while another target student, from a different class, could be at the opposite end of the continuum of scores within his/her class. Our selected group of target students, however, comes from a much narrower achievement band than the total population of students that were tested. The procedures used helped reduce variability among the selected target students, but by no means did we eliminate all of the variation among the selected students.

Table 1

Breakdown of Second and Third Graders
Tested with Selection Battery by Class

Class Code	Second Graders	Third Graders	Total
01	10	11	21
02	22	0	22
03	24	0	24
04	30	0	30
05	29	0	29
06	30	0	30
08	25	0	25
12	24	0	24
13	8	4	12
15	24	0	24
16	33	2	35
17	27	0	27
18	24	0	24
19	28	0	28
20	30	0	30
21	14	0	14
23	19	0	19
24	21	0	21
26	11	12	23
27	13	0	13
28	27	0	27
29	30	0	30
32	27	0	27
34	26	0	26
35	22	0	22
37	29	0	29
38	34	0	34
41	10	0	10
45	12	11	23
54	23	0	23
55	25	0	25
56	21	0	21
57	15	0	15
58	14	0	14
59	17	0	17
61	18	0	18
62	8	18	26
67	18	0	18
68	29	0	29
70	22	0	22
	873	58	931

Table 2

Breakdown of Fourth, Fifth, and Sixth Graders Tested with Selection Battery by Class

Class Code	Fourth Graders	Fifth Graders	Sixth Graders	Total
22	0	24	0	24
73	0	20	0	20
74	0	26	0	26
75	0	11	0	11
76	0	29	0	29
77	0	25	0	25
78	0	24	0	24
79	1	29	0	30
80	0	26	0	26
82	0	17	0	17
83	0	25	0	25
84	0	17	0	17
85	0	9	20	29
86	0	27	0	27
87	0	15	0	15
92	20	9	0	29
93	0	23	0	23
94	0	27	0	27
95	0	31	0	31
98	0	17	0	17
99	0	26	0	26
100	0	25	0	25
101	0	27	0	27
102	0	26	0	26
103	0	30	0	30
104	0	21	0	21
105	0	20	0	20
106	0	28	0	28
107	0	22	0	22
108	0	29	0	29
109	0	28	0	28
111	2	9	10	21
112	0	30	0	30
113	0	18	0	18
114	0	22	0	22
115	0	24	0	24
116	0	14	0	14
117	0	14	13	27
118	8	21	0	29
120	0	23	0	23
121	0	17	0	17
	31	905	43	979

Table 3

Number of Students Tested
with Selection Battery
Grades 2 and 5

Grade 2

	Second Graders	Third Graders	Total by Sex
Boys	428	32	460
Girls	445	26	471
Total by Grade	873	58	931

Grade 5

	Fourth Graders	Fifth Graders	Sixth Graders	Total by Sex
Boys	21	490	23	534
Girls	10	415	20	445
Total by Grades	31	905	43	979

Table 4

Low and High Scores Defining Achievement Bands
for Selecting Target Students
Grades 2 and 5
Reading and Mathematics Selection Batteries

	Mathematics		Reading	
	Low Score in Band	High Score in Band	Low Score in Band	High Score in Band
Grade 2	5 (6.01)	19 (21)	5.5 (8.5)	22 (22.5)
Grade 5	9 (9)	22 (19.9)	12 (17)	33 (33)

Table 5

Fictitious Listing of Grade 2 Students
Ordered by Math Screen Test Score

TEACHER ID NUMBER= 28

GRADE	STUDENT ID NUMBER	STUDENT NAME	SEX	MATH SCORE	READING SCORE
2	2	George, Marsha	F	25.33	32.33
2	4	Smith, Debbie	F	18.17	21.67
2	26	Matthews, Millicent	F	17.00	19.17
2	3	Lewis, Lola	F	16.33	19.67
2	21	O'Neill, Patricia	F	13.33	30.75
2	10	Stentson, Fern	F	13.33	11.92
2	17	Cook, Connie	F	12.50	13.33
2	6	Tester, Ida	F	8.00	21.75
2	7	Logo, Joanne	F	6.67	20.92
2	11	St. John, Marcia	F	4.33	10.75
2	25	Paulson, Paula	F	3.17	-1.58
2	5	LaRossa, Jean	F	1.83	-1.50
2	12	Holster, Gina	F	1.17	21.00
2	23	Smith, Kattie	F	-1.00	6.83
2	1	Unger, David	M	27.00	31.00
2	27	Stanley, Paul	M	22.33	33.67
2	24	Pomp, Tommy	M	18.33	22.00
2	13	Erts, Ernest	M	15.00	14.83
2	16	Mounts, Anthony	M	11.67	20.58
2	9	Robinson, Chuck	M	9.00	30.75
2	8	Stamen, Richard	M	7.00	2.83
2	14	Baxter, Russel	M	6.50	20.33
2	20	Haggan, Harold	M	4.67	9.25
2	19	Gable, Michael	M	2.67	6.00
2	18	Prince, Freddie	M	2.17	19.08
2	22	Findley, Arthur	M	-1.00	11.33
2	15	O'Rourke, Stanley	M	-1.50	9.33

Table 6

Psychometrics
Reading and Mathematics
Grades 2 and 5
Phase III-B
(Phase III-A Model Data in Parentheses)
N = 873

Grade 2

	N Items	Reliability Coefficient	Standard Error of Measurement
Reading	35	.91 (.92)	3.06 (2.82)
Mathematics	47	.85 (.88)	3.76 (4.00)

Grade 5

Reading	43	.90 (.93)	3.48 (2.95)
Mathematics	34	.91 (.90)	2.88 (3.00)

Table 7

Summary Data for
Selected (Target) and Non-Selected
Boys and Girls - Grade 2

			N	$\bar{X}$	$\sigma^2(\sigma)$	Q_1	Q_2	Q_3	L	H
BOYS	Mathematics	Selected (Target)	71	11.2	17.9 (4.2)	7.9	10.4	14.0	1.0	19.0
		Non-Selected	357	12.4	117.4 (10.8)	3.5	10.2	19.1	- 8.3	47.0
	Reading	Selected (Target)	71	16.3	35.3 (5.9)	11.2	17.9	20.7	4.3	26.4
		Non-Selected	357	17.8	129.3 (11.4)	7.0	17.6	27.0	- 4.3	35.0
GIRLS	Mathematics	Selected (Target)	79	10.6	16.8 (4.1)	7.4	10.3	13.4	2.7	19.5
		Non-Selected	366	12.9	107.9 (10.4)	4.9	10.8	20.1	- 9.8	47.0
	Reading	Selected (Target)	79	17.0	28.6 (5.4)	12.6	17.4	19.6	6.6	35.0
		Non-Selected	366	20.9	109.7 (10.5)	11.8	23.8	29.6	- 2.3	35.0

Table 8

Summary Data for
Total Selected (Target) and Total Non-Selected
Students - Grade 2

		N	$\bar{X}$	$\sigma^2(\sigma)$	Q_1	Q_2	Q_3	L	H
Mathematics	Selected (Target)	150	10.9	17.3 (4.2)	7.5	10.3	13.9	1.0	19.5
	Non-Selected	723	12.6	112.5 (10.6)	4.2	10.6	19.7	- 9.8	47.0
Reading	Selected (Target)	150	16.7	31.7 (5.6)	12.1	17.5	20.1	4.3	35.0
	Non-Selected	723	19.1	122.7 (11.1)	9.8	21.4	29.1	- 4.3	35.9

Table 9

Summary Data for
Selected (Target) and Non-Selected
Boys and Girls - Grade 5

			N	$\bar{X}$	$\sigma^2(\sigma)$	Q_1	Q_2	Q_3	L	H
BOYS	Mathematics	Selected (Target)	72	16.5	21.1 (4.6)	12.7	16.7	20.1	.33	24.3
		Non-Selected	421	12.9	112.6 (10.6)	3.4	11.6	21.6	- 6.0	34
	Reading	Selected (Target)	72	25.6	47.8 (6.9)	22.5	26.8	30.3	8.8	35.0
		Non-Selected	421	23.4	151.1 (12.3)	12.7	26.2	33.7	-2.8	43
GIRLS	Mathematics	Selected (Target)	62	16.7	14.9 (3.9)	13.6	16.5	19.4	10.0	25.0
		Non-Selected	357	16.2	95.2 (9.8)	8.3	17.2	23.8	-4.7	34
	Reading	Selected (Target)	62	26.5	43.3 (6.6)	21.0	26.8	31.7	12.3	37.3
		Non-Selected	357	25.6	121.7 (11.0)	16.7	28.4	34.5	-4.0	43

Table 10

Summary Data for Total
Selected (Target) and Non-Selected
Boys and Girls - Grade 5

		N	$\bar{X}$	$\sigma^2(\sigma)$	Q_1	Q_2	Q_3	L	H
Mathematics	Selected (Target)	134	16.6	18.1 (4.3)	12.9	16.5	19.4	.33	25
	Non-Selected	778	14.4	107.1 (10.4)	5.2	13.8	22.7	- 6.0	34
Reading	Selected (Target)	134	26.0	45.6 (6.8)	22.4	26.8	31.1	8.8	37.3
	Non-Selected	778	24.4	138.7 (11.8)	14.6	26.9	34.4	- 4.0	43

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